Amendments to the claims:

1. (Currently Amended) A method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen in an image generating arrangement, such as the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of the illuminated specimen, comprising:

determining at least one spectral centroid ~~and;~~

~~determining a maximum of emission radiation and/or of absorbed radiation of the illuminated specimen~~.

2. (Currently Amended) The method according to claim 1, wherein the determination of the centroid ~~and of the maximum~~ of the emission radiation of fluorochromes is carried out for distinguishing different dyes or for determining the local dye composition of an image point when a plurality of dyes are used simultaneously or for determining the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached or for measuring emission ratio dyes for determining ion concentrations.

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3. (Currently Amended) The method according to claim 1, wherein the determination of the centroid ~~and of the maximum~~ of the reflected or transmitted excitation radiation of fluorochromes is carried out for distinguishing different dyes or for determining the local dye composition of an image point when a plurality of dyes are used simultaneously or for determining the local shift in the absorption spectrum depending on the local environment to which the dye or dyes is or are attached or for measuring the absorption ratio for determining ion concentrations.

4. (Currently Amended) The method according to claim 1, further comprising splitting the emission radiation of the specimen <u>by</u> a dispersive element and ~~is detected~~ <u>detecting the split radiation</u> in a spatially resolved manner in at least one direction.

5. (Previously Presented) The method according to claim 1, further comprising splitting the fluorescent radiation.

6. (Currently Amended) The method according to claim 1, further comprising splitting the radiation reflected or transmitted by the specimen ~~is split~~ by a dispersive element for absorption measurement and ~~is detected~~ detecting the split radiation in a spatially resolved manner in at least one direction.

7. (Currently Amended) The method according to claim 1, further comprising carrying out a spectral weighting between a plurality of detection channels,

summing of weighted channels of signals of the detection channels; and

summing of the detection channels ~~is carried out~~.

B1 cont

8. (Currently Amended) The method according to claim 1, further comprising weighting the signals of the detection channels in that they are multiplied by a weighting curve,

generating a sum signal in that the sum of the channels taken into account is determined, and

generating a position signal ~~is generated~~ in that the sum of weighted signals is divided by the sum signal.

9. (Original) The method according to claim 8, wherein the weighting curve is a straight line.

10. (Previously Presented) The method according to claim 1, further comprising:

converting signals of detection channels digitally;

reading out the signals of the detection channels and;

weighting and summing the signals of the detection channels digitally in a computer.

11. (Previously Presented) The method according to claim 10, wherein the weighting and summing of the signals of the detection channels are carried out with analog data processing by means of a resistance cascade.

12. (Previously Presented) The method according to claim 11, further comprising adjusting the resistances.

13. (Previously Presented) The method according to claim 8, further comprising adjusting the weighting curve.

14. (Previously Presented) The method according to claim 1, further comprising influencing the signals of detector channels by a nonlinear distortion of the input signals.

15. (Previously Presented) The method according to claim 1, further comprising adjusting the integration parameters.

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16. (Previously Presented) The method according to claim 1, further comprising adjusting a characteristic or response curve of an amplifier.

17. (Previously Presented) The method according to claim 8, further comprising determining in analog a position signal and;

determining in analog the sum signal,

converting the position signal and the sum signal and;

reading out digitally the position signal and the sum signal.

18. (Previously Presented) The method according to claim 7, wherein an upper and a lower signal corresponding to the sum of the signals of individual channels which are weighted by opposing weighting curves are read out, digitally converted and fed to the computer.

19. (Previously Presented) The method according to claim 8, wherein a position signal and the sum signal are used to generate an image.

20. (Original) The method according to claim 1, wherein a color-coded fluorescence image is generated.

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21. (Original) The method according to claim 1, wherein a superposition is carried out with additional images.

B3

22. (Previously Presented) The method according to claim 8, wherein a position signal and the sum signal are combined with a lookup table.

B4

23. (Original) The method according to claim 22, wherein representation of different dyes and/or the spread of the generated image is carried out by means of the lookup table.

B5

24. (Previously Presented) The method according to claim 1, wherein a comparison of a measured signal with a reference signal is carried out via comparators in detection channels and in case the reference signal is not reached or is exceeded a change in a operating mode of a detection channel is carried out.

25. (Previously Presented) The method according to claim 24, wherein a respective detection channel is switched off or not taken into account.

26. (Previously Presented) The method according to claim 1, wherein a relevant spectral region is narrowed in this way.

27. (Previously Presented) The method according to claim 1, wherein signals of detection channels are generated by at least one integrator circuit.

28. (Previously Presented) The method according to claim 1, wherein signals of detection channels are generated by photon counting and subsequent digital-to-analog conversion.

29. (Previously Presented) The method according to claim 1, wherein a photon counting is carried out in time correlation.

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30. (Original) The method according to claim 1, for detection of single-photon and/or multiphoton fluorescence and/or fluorescence excited by entangled photons.

31. (Original) The method according to claim 1, with parallel illumination and detection, in ingredient screening, wherein the specimen is a microtiter plate.

32. (Original) The method according to claim 1, in a microscope.

33. (Original) The method according to claim 1, for detection in a nearfield scanning microscope.

34. (Original) The method according to claim 1, for detection of a single-photon and/or multiphoton dye fluorescence in a fluorescence-correlated spectroscope.

35. (Original) The method according to claim 1, using confocal detection.

36. (Original) The method according to claim 1, using a scanning arrangement.

37. (Previously Presented) The method according to claim 1, using an X-Y scanner in illumination means.

38. (Original) The method according to claim 1, using an X-Y scan table.

39. (Original) The method according to claim 1, using nonconfocal detection.

40. (Original) The method according to claim 1, using a scanning arrangement.

41. (Original) The method according to claim 1, using descanned detection.

42. (Original) The method according to claim 1, using brightfield imaging.

43. (Original) The method according to claim 1, using point imaging.

44. (Original) The method according to claim 1, using non-descanned detection.

45. (Original) The method according to claim 1, using brightfield imaging.

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46. (Original) The method according to claim 1, using non-scanning, confocal or nonconfocal detection and point imaging or brightfield imaging.

47. (Original) The method according to claim 1, using an X-Y scan table.

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48. (Currently Amended) An arrangement for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen, particularly the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of an illuminated specimen, comprising:

means for determining at least one spectral centroid~~,~~

~~and means for determining a maximum of emission radiation, or of absorbed radiation~~.

B10

49. (Original) The arrangement according to claim 48, wherein the emission radiation of the specimen is split by a dispersive element and is detected in a spatially resolved manner in at least one direction.

50. (Original) The arrangement according to claim 48, wherein a splitting of the fluorescent radiation is carried out.

51. (Original) The arrangement according to claim 48, wherein the radiation reflected or transmitted by the specimen is split by a dispersive element for absorption measurement and is detected in a spatially resolved manner in at least one direction.

B11

52. (Previously Presented) The arrangement according to claim 48, wherein a spectral weighting is carried out between a plurality of detection channels, summing of weighted channels of the signals of the detection channels and summing of detection channels is carried out.

53. (Previously Presented) The arrangement according to claim 52, wherein signals of detection channels are weighted in that they are multiplied by a weighting curve, a sum signal is generated in that the sum of the channels taken into account is determined, and a position signal is generated in that the sum of weighted signals is divided by the sum signal.

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54. (Original) The arrangement according to claim 53, wherein the weighting curve is a straight line.

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55. (Previously Presented) The arrangement according to claim 52, wherein signals of detection channels are converted and digitally read out and weighting and summing are carried out digitally in a computer.

B14

56. (Original) The arrangement according to claim 52, wherein the weighting and summing are carried out with analog data processing by means of a resistance cascade.

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57. (Previously Presented) The arrangement according to claim 56, wherein resistances are adjustable.

B16

58. (Original) The arrangement according to claim 56, wherein the weighting curve is adjustable.

59. (Previously Presented) The arrangement according to claim 53, wherein a position signal and the sum signal are determined in analog, converted, and read out digitally.

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60. (Previously Presented) The arrangement according to claim 52, wherein an upper and a lower signal corresponding to the sum of the signals of individual channels which are weighted by opposing weighting curves are read out, digitally converted and fed to the computer.

61. (Previously Presented) The arrangement according to claim 53, wherein a position signal and the sum signal are used to generate an image.

62. (Original) The arrangement according to claim 48, wherein a color-coded fluorescence image is generated.

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63. (Original) The arrangement according to claim 48, wherein a superposition is carried out with additional images.

B19

64. (Previously Presented) The arrangement according to claim 53, wherein a position signal and the sum signal are combined with a lookup table.

B20

65. (Original) The arrangement according to claim 64, wherein representation of different dyes and/or the spread of the generated image is carried out by the lookup table.

B21

66. (Previously Presented) The arrangement according to claim 48, wherein a comparison of a measured signal with a reference signal is carried out via comparators in detection channels and in case the reference signal is not reached or is exceeded a change in a operating mode of a detection channel is carried out.

67. (Previously Presented) The arrangement according to claim 48, wherein a respective detection channel is switched off and/or not taken into account.

68. (Previously Presented) The arrangement according to claim 48, wherein a relevant spectral region is narrowed in this way.

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69. (Original) The arrangement according to claim 48, wherein signals of detection channels are generated by at least one integrator circuit.

70. (Original) The arrangement according to claim 48, wherein signals of detection channels are generated by photon counting and subsequent digital-to-analog conversion.

B23

71. (Previously Presented) The arrangement according to claim 70, wherein a photon counting is carried out in time correlation.

B24

72. (Original) The arrangement according to claim 48, for detection of single-photon and/or multiphoton fluorescence and/or fluorescence excited by entangled photons.

73. (Original) The arrangement according to claim 48, with parallel illumination and detection, in ingredient screening, wherein the specimen is a microtiter plate.

74. (Original) The arrangement according to claim 48, incorporated in a microscope.

75. (Original) The arrangement according to claim 74, for detection in a nearfield scanning microscope.

B24 end

76. (Original) The arrangement according to claim 48, for detection of a single-photon and/or multiphoton dye fluorescence in a fluorescence-correlated spectroscope.

77. (Original) The arrangement according to claim 48, incorporating confocal detection.

78. (Original) The arrangement according to claim 48, including a scanning arrangement.

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79. (Previously Presented) The arrangement according to claim 48, including an X-Y scanner in illumination source.

80. (Original) The arrangement according to claim 48, including an X-Y scan table.

81. (Original) The arrangement according to claim 48, incorporating nonconfocal detection.

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82. (Original) The arrangement according to claim 48, with descanned detection.

83. (Original) The arrangement according to claim 48, with brightfield imaging.

84. (Original) The arrangement according to claim 48, with point imaging.

85. (Original) The arrangement according to claim 48, with non-descanned detection.

86. (Original) The arrangement according to claim 48, with non-scanning, confocal or nonconfocal detection and point imaging or brightfield imaging.

87. (New) A method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen in an image generating arrangement, such as the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of the illuminated specimen, comprising:

determining at least one spectral centroid, wherein the determination of the centroid of the emission radiation of fluorochromes is carried out for:

distinguishing different dyes;

determining the local dye composition of an image point when a plurality of dyes are used simultaneously;

determining the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached; or

B24 cont

for measuring emission ratio dyes for determining ion concentrations;

splitting the emission radiation of the specimen by a dispersive element and detecting the split radiation in a spatially resolved manner in at least one direction;

carrying out a spectral weighting of the plurality of detection channels,

summing weighted channels of signals of the detection channels; and

summing the detection channels.

88. (New) A method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen in an image generating arrangement, such as the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of the illuminated specimen, comprising:

determining at least one spectral centroid, wherein the determination of the centroid of the emission radiation of fluorochromes is carried out for:

distinguishing different dyes;

determining the local dye composition of an image point when a plurality of dyes are used simultaneously;

determining the local shift of the emission spectrum depending on the local environment to which the dye or dyes is or are attached; or

for measuring emission ratio dyes for determining ion concentrations;

splitting the fluorescent radiation of the specimen by a dispersive element and detecting the split radiation in a spatially resolved manner in at least one direction;

carrying out a spectral weighting of the plurality of detection channels,

summing weighted channels of signals of the detection channels; and

summing the detection channels.

89. (New) A method for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen in an image generating arrangement, such as the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of the illuminated specimen, comprising:

determining at least one spectral centroid, wherein the determination of the centroid of reflected or transmitted excitation radiation of fluorochromes is carried out for:

b2 cont

distinguishing different dyes;

determining the local dye composition of an image point when a plurality of dyes are used simultaneously;

determining the local shift in the absorption spectrum depending on the local environment to which the dye or dyes is or are attached; or

measuring the absorption ratio for determining ion concentrations;

splitting the radiation reflected or transmitted by the specimen by a dispersive element for absorption measurement and detecting the split radiation in a spatially resolved manner in at least one direction;

carrying out a spectral weighting of the plurality of detection channels,

summing weighted channels of signals of the detection channels; and

summing the detection channels.

90. (New) An arrangement for optical detection of characteristic quantities of the wavelength-dependent behavior of an illuminated specimen, particularly the emission behavior, absorption behavior, fluorescence, luminescence, phosphorescence, enzyme-active light emission, or enzyme-active fluorescence of an illuminated specimen, comprising:

means for determining at least one spectral centroid;

a dispersive element that split the emission radiation of the specimen; and

a detector operable to detect the split radiation in a spatially resolved manner in at least one direction;

wherein a spectral weighting of a plurality of detection channels is carried out, and a

B24 end

summing of weighted channels of the signals of the detection channels and summing of detection channels are carried out.